

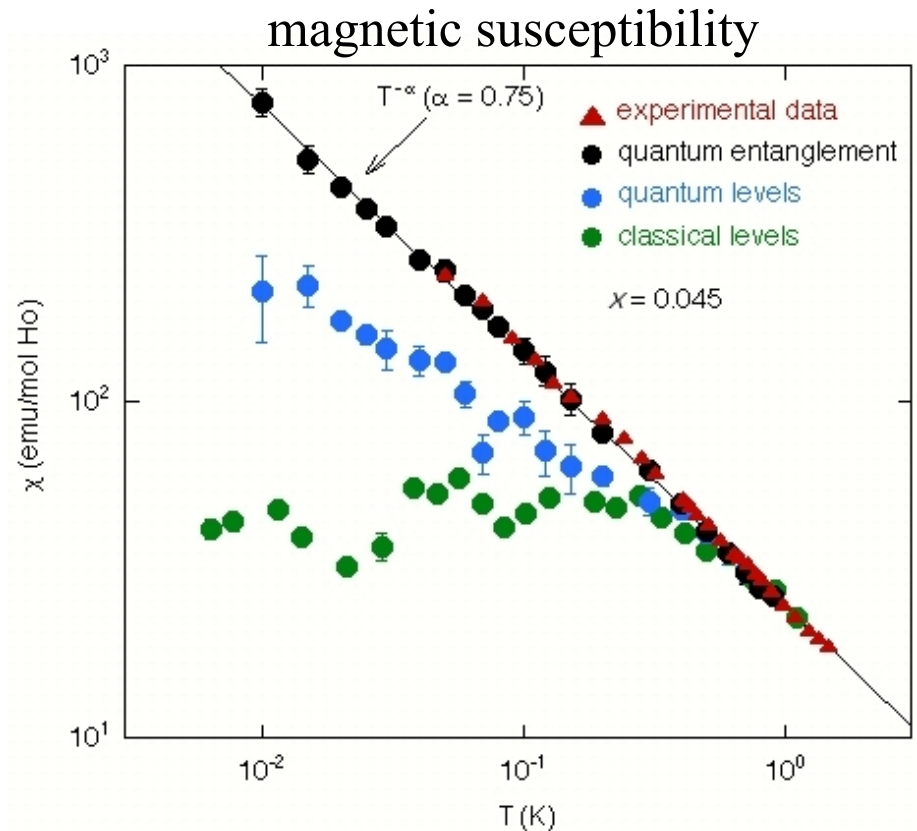
Complex Properties of Disordered Quantum Systems, Susan Coppersmith, University of Wisconsin, DMR-0209630

This work done in collaboration with S. Ghosh and T.F. Rosenbaum, University of Chicago (supported by DMR-021374), and G. Aeppli, University College London

Entanglement is a fundamental and peculiar quantum correlation between different objects. We investigated a model of the dipolar quantum magnet

$\text{LiHo}_{0.045}\text{Y}_{0.955}\text{F}_4$ via a pairwise renormalization group calculation.

The results for the bulk magnetic susceptibility using unentangled and entangled wavefunctions differ significantly, with the latter agreeing well with experiments with no adjustable parameters. This work demonstrates that the bulk properties of this quantum magnet are strongly affected by microscopic entanglement.



using entangled wavefunctions in calculation
↻ smooth magnetic susceptibility that agrees well with experimental data